

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

<b>In the Matter of</b>	)	
	)	
<b>Procedures to Govern the Use of</b>	)	<b>IB Docket No. 02-10</b>
<b>Satellite Earth Stations on Board</b>	)	
<b>Vessels in Bands Shared With</b>	)	
<b>Terrestrial Fixed Service</b>	)	

**COMMENTS OF THE BOEING COMPANY**

These comments are in response to the Commission’s Notice of Inquiry regarding “issues related to the authorization of satellite earth stations on board vessels (ESVs).”<sup>1</sup> Boeing Space and Communications is a launch services provider and a satellite systems manufacturer. As such, it has an interest in development of regulatory frameworks that welcome new, innovative satellite services. In particular, Boeing has an interest in ESVs that may operate on wide bandwidths using high data rates on slow moving vessels. Examples of this class of Earth Station on Vessels (ESV) are those used for sea-based launch operations and to transmit ocean seismic data.

The current regulatory structure does not provide a normalized process for licensing ESVs. This may not be a significant issue for the short-term or local U.S. waters ESV operations that can be accommodated by existing processes (e.g., STAs and waivers). However, a licensing structure should be established that will allow long term licenses for systems intended for regular use and that will give a framework to facilitate operations in foreign waters and frequency coordination with other administrations.

Substantial work towards creating international rules and standards for ESV operation has been done in ITU-R WP 4-9S. That work has been highly valuable in demonstrating certain scenarios in which ESVs may operate without causing interference to other services. In particular, attention has been paid to conditions to demonstrate

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<sup>1</sup> See ¶ 1 of “In the Matter of Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in Bands Shared With Terrestrial Fixed Service,” Notice of Inquiry, FCC 02-18, IB Docket No. 02-10, released February 4, 2002.

compatible operations with terrestrial services sharing the same bands. There are some aspects of the ITU deliberations, however, that do not translate to US interests, making it impractical to consider broad adoption of the ITU conclusions for application to the US regulatory context.

First, some of the WP 4-9S studies presuppose sharing conditions at Ku band that are not representative of U.S. sharing scenarios. The main study determines “the minimum distance from the coastline beyond which in-motion ESVs would not cause unacceptable interference to the FS”<sup>2</sup> for the 5925-6425 MHz and 14-14.5 GHz bands. This determination is based on worst-case sharing environments. For example, it is assumed that the azimuth pointing of the earth station is in the same direction as the interfered-with fixed station receiver. In an actual scenario, the ESV antenna could be directed away from the fixed station receiver. Also, in the 14-14.5 GHz band, in the U.S., there very likely will be no fixed station receiver operations in the vicinity of the shore. Therefore, implementation of this minimum distance determined by WP 4-9S studies would be inappropriate for the U.S. in the 14-14.5 GHz band. In this case, the Commission should allow less restrictive licensing, given the paucity of terrestrial usage.

Second, the studies do not consider the high data rate, wide bandwidth, slow moving class of ESVs of interest to Boeing. For example, to enable sharing with terrestrial services, WP 4-9S<sup>3</sup> and the U.S. WRC-03 Advisory Committee<sup>4</sup> have considered limits on ESV operating parameters such as maximum bandwidth and minimum elevation angle. The specific limits considered would severely restrict, if not preclude the operation of the class of ESVs in which Boeing has interest. In this case, these limits are not applicable, nor are they needed. These ESVs can easily avoid causing harmful or impermissible interference to terrestrial networks through utilization of one or

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<sup>2</sup> In recommends 1 and 2 of the April 25, 2002 WP 4-9S plenary session revision to “DRAFT NEW RECOMMENDATION ITU-R SF.[4-9S/ESV-A]: The minimum distance from the coastline beyond which in-motion earth stations located on board vessels would not cause unacceptable interference to the fixed service in the bands 5 925-6 425 MHz and 14-14.5 GHz,” Document 4-9S/TEMP/102(Rev.1)-E, 24 April 2002.

<sup>3</sup> See “DRAFT CPM-02 TEXT ON WRC-03 AGENDA ITEM 1.26,” Document 4-9S/TEMP/127-E, 25 April, 2002.

<sup>4</sup>See WRC-03 Advisory Committee Document 088 (19.12.01), which is the same as “IWG-4 DRAFT PROPOSAL On Agenda Item 1.26,” Document IWG-4/17rev4 (Dec. 17, 2001). Conclusions in this document are principally based on studies done in ITU-R WP 4-9S.

more of the following techniques/ESV system attributes: High ESV transmission antenna directivity combined with transmitting only when the antenna azimuth is pointed sufficiently away from land receivers; ESV transmission only beyond adequate distances from shore; ESV transmission only in bands not used by adjacent land stations; use of guard bands to avoid adjacent channel interference to terrestrial stations; very limited numbers of ESVs; fast and precise antenna trackers; frequency coordination that would use one or more of the aforementioned techniques. The use of high transmission antenna directivity and fast, precise antenna trackers also will enable these ESVs to avoid causing harmful or impermissible interference to satellite networks.

In the short term, limited licensing of this class of ESVs through Special Temporary Authorizations (STAs), waivers, and experimental licensing should be allowed on a case-by-case basis, without parameter limits that would severely restrict their operation. This would allow both tight management of any interference from high data rate, wide bandwidth, slow-moving ESVs and valuable services to be provided by them. Consideration of less restrictive licenses for these ESVs will require new interference studies.

Boeing encourages the Commission to develop normalized licensing processes to facilitate long term and international ESV operation. We applaud the substantial work done within WP 4-9S on international ESV sharing issues that balances a diverse set of interests. At the same time, however, we urge the Commission to consider licensing frameworks that also account for sharing scenarios and operating parameters that vary from those considered in WP 4-9S studies. Licensing restrictions in the 14-14.5 GHz band surely should be less restrictive than those in the 5925-6425 MHz band because of the orders of magnitude less terrestrial usage of the 14-14.5 GHz band. Also, the Commission should not overlook the fact that a small but not insignificant number of ESVs have operational characteristics that are different from the ones studied thus far. Further, when the Commission considers the formulation of a regulatory framework for ESVs, it should consider the benefits of flexibility to accommodate systems that, while not fitting a preconceived array of characteristics, nevertheless are capable of being operated so as not to cause interference to other allocated services.

Respectfully submitted,

**THE BOEING COMPANY**

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